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CASTONE - COMPOSITE BUILDING PANEL

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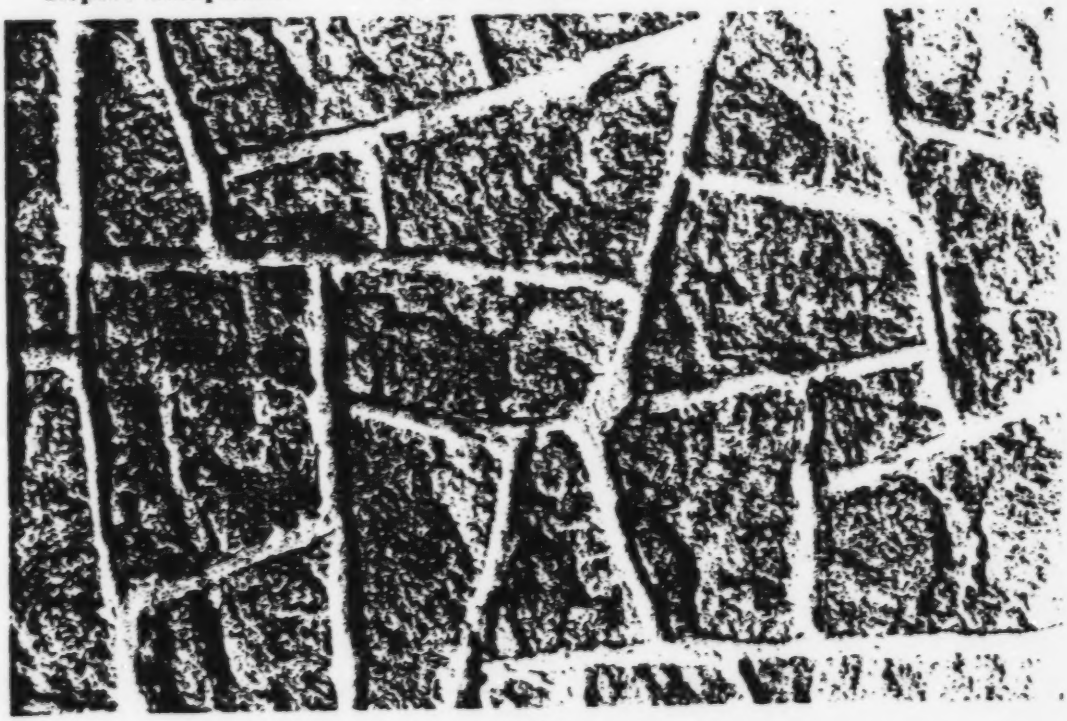
This project was carried out with the assistance of a grant from Canada Mortgage and Housing Corporation under the terms of the Housing Technology Incentives Program (HTIP). The views expressed are those of the author and do not represent the official views of the Corporation.

Project Title: CASTONE - COMPOSITE BUILDING PANEL

Author's Name: GLENN J. BLANCHARD

Report Completed: JULY 27, 1990



ACKNOWLEDGEMENT

Canada Mortgage and Housing Corporation's 'Technology Incentive Program', is an asset to the introduction of new products to the Canadian marketplace.

We wish to take this opportunity to express our appreciation to Canada Mortgage and Housing Corporation, for their encouragement and interest in our product, as well as partial funding for development.

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EXECUTIVE SUMMARY

The present invention provides an innovative interior/exterior surfacing alternative to brick or conventional siding materials, without the costs and application problems associated therewith. The invention represents an improvement over prior art composite building panels, in that the surface of the panel can be made to replicate any conventional surfacing material either natural or man-made, in texture and appearance, while exceeding the insulative properties thereof. In addition the panels are relatively lightweight, requiring less structure to support the weight of the facade as compared with that for natural stone. Furthermore, they can be easily installed, even by inexperienced persons. Installation can be achieved year round in all weather conditions employing readily available industrial adhesives and fasteners. The panels can be cut by standard wood-cutting tools such as, a carpenter's handsaw, a circular saw or sabre saw, and can be conveniently drilled using standard high-speed drill bits.

The method of manufacture of the panels leads to fast production times, and therefore, a more cost-efficient panel; this results in a panel of generally uniform weight, regardless of the surface configuration.

Various finishing techniques allow the panels to be produced in a variety of colours or tones, including multi-tonal colour variations. Accordingly, there is provided in one aspect of the invention, a composite building panel which comprises a surface layer of cementitious material to which is adhered a supporting layer of foamed insulating material in a compression moulding process. An open weave scrim-cloth-type material is embodied within the surface layer to minimize the possibility of breakage (increases impact resistance), and to introduce dimensional stability to the panel. A mould is used to impart a texture and appearance to the surface layer which recreates all the authenticity of the original surfacing or siding material from which the mould was produced. Although the surface layer is moulded, the thickness of the surface layer is maintained substantially and at a predetermined minimum.

BACKGROUND OF THE INVENTION

Stone has been employed as an exterior cladding.,ie., surfacing materials, in the building and construction industry for hundreds of years. Today, the cost of natural stone construction tends to limit its application to that small portion of the market that can afford such a luxury. Brick and other siding materials have, for the most part, been used as substitutes due to their relatively low cost, compared to natural stone. There is however, a need for high-quality surfacing materials which exhibit all the authenticity of conventional surfacing materials.,i.e., texture, appearance and durability, but without the cost or application problems associated with natural stone or existing substitutes.

After consultation with architects, contractors, builders and renovation type companies, D.D.M., introduced a program of research. This research was to determine the feasibility of producing a wall surfacing materials which would satisfy all the above mentioned criterion; yet one which could be produced utilizing our own proprietary technology.

An initial selection of raw materials was made, as well as the preliminary temporary tooling. Using this tooling, we developed formulations, production processes, and conducted necessary testing for evaluation. Samples were produced and shown to potential clients. A patent search was conducted which indicated no patent infringement on the end product or on the processes. Full size tooling was then produced, test installations were made and fine tuning was done. Thereafter, material was submitted for official testing to building codes; all results of the tests exceeded approval requirements.

We feel we have developed the ideal product to satisfy the need at a price competitive to the conventional siding market.

THE SPECIFIC OBJECTIVES OF THE PROJECT:

To develop a product to fill the void in the wall surfacing trade for construction of commercial and residential structures on both interior and exterior surfaces. Such as:

A. Residential Exterior Wall Treatment

Represents the largest portion of existing market for CASTONE, and the most easily recognizable application.
- covering for exposed concrete below siding above grade.
- retaining wall for gardens and terracing of property.

B Residential Interior Wall Treatment

Insulating, decorative wall treatment in living rooms and recreation rooms etc.

C Churches

Exterior wall cladding for church construction both new and renovated.
- adds to appearance.

D Commercial Exterior

Fast food chains, retail plazas and industrial malls.

E Hotels

Both interior and exterior applications in hotel construction.
- public areas - restaurants, lounges, etc.
- swimming pool areas and public area fountains.

F Institutional Use

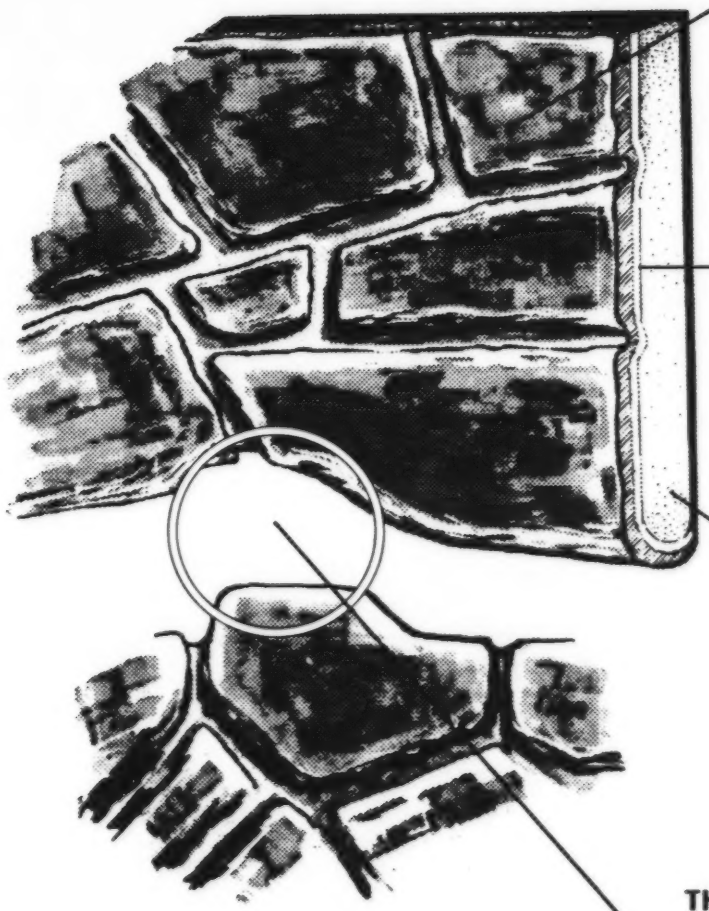
University buildings - external design treatment.
Libraries and Museums - for exterior and/or interior design.
Country club - clubhouse exteriors.

CASTONE, is applicable to all the above uses as a cost efficient, innovative, surfacing alternative to brick or conventional siding materials.

DETAILED DESCRIPTION

The invention relates to "CASTONE" composite building panel and to methods for the manufacture of the panel. In particular, the invention is concerned with a composite panel, comprising a supporting layer of insulating material, which is adhered to a surface layer of cementitious material in a compression moulding process. An open weave scrim-cloth-type material is encapsulated into the surface layer to, amongst other things, minimize the possibility of breakage of the panel and introduce dimensional stability. The moulding process is used to impart a texture and appearance to surface layer, which can be made to replicate the texture and appearance of conventional surfacing materials.

Drawing #1



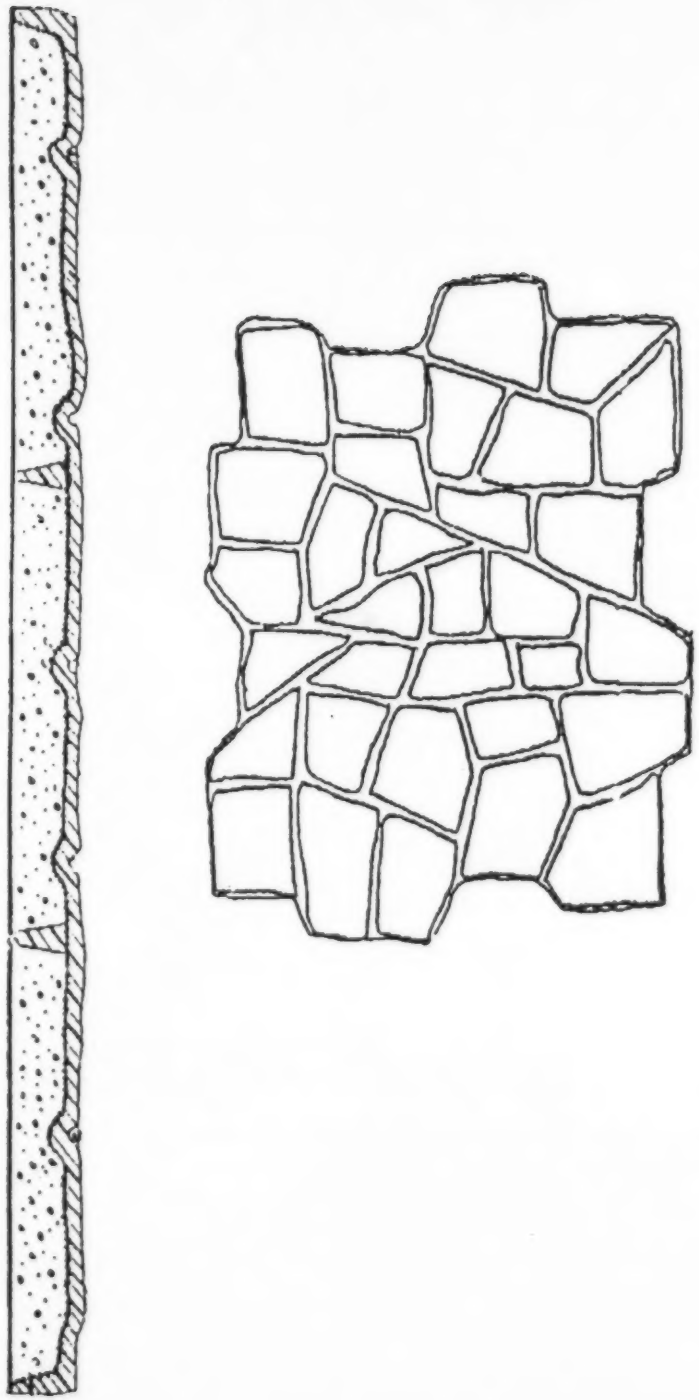
OUTER LAYER IS COMPRISED OF A SPECIAL STONE FORMULATION WHICH RE-CREATES ALL THE AUTHENTICITY OF NATURAL STONE

SCRIM CLOTH MIDDLE LAYER PROVIDES STRUCTURAL STRENGTH AND REINFORCEMENT

THE CAVITY IS SUPPORTED BY A HIGH DENSITY STRUCTURAL FOAM INSULATION

THE PANELS EACH OF A DIFFERENT PATTERN FIT ONE INTO THE OTHER THERE-BY ELIMINATING EXCESSIVE PATTERN CONTINUITY

Drawing #2



PROTOTYPE DEVELOPMENT

Initially small sections approximately 3'x3'x2" were produced using various cementitious material compositions in order to determine the products reaction to preliminary tests (in house) such as R-Value, freeze-thaw, water penetration, impact resistance, surface fire resistance.

After reviewing initial tests we determined that it was necessary to increase the cementitious surface thickness to nominal 40mm. It was also necessary to develop a production means by which we could control surface thickness to follow the pattern of the exterior surface in order to minimize excessive weight as would be created by a flat inner shell surface. Reference drawings (pages 8 & 9).

We determined it was also necessary to incorporate a scrim-cloth type material to give proper bonding between the surface and the foam filler. This eliminated possible delamination.

We repeated the aforementioned tests on the new samples and established that the initial problem encountered had been corrected.

Using a blow torch a surface flame spread test was made. No deterioration or extreme discoloration was noted.

Full size tooling was then produced representing six original, 4' x 4' x 2" panels, each of a different pattern with nesting edges to produce a possible 8' x 12' wall section without pattern repeat. Once completed, six independent moulds were produced using the original models for patterns. Using this tooling, full scale panels were produced. A single test installation was made to determine the end appearance and to properly establish the method of application.

It was decided that our installation approach using construction adhesive supported by 4 plated screws (1 each corner) was the proper approach. No changes were deemed necessary.

At this point, we prepared necessary sample materials to furnish to Warnock Hersey for testing to Building Codes. The results were as follows:

Reference "Appendix" B, Report #4064-1 (Warnock Hersey)

Freeze-Thaw - ASTM C67

Results - Surface some-what, but uniformly bleached. Weight loss of 5.2% average. No other changes.

Corrective Action - It was determined that the bleaching was due to a powderous surface layer of the cementitious material left at time of moulding. We now wash the panels after the moulding process. This operation seemed to correct this problem. Weight loss only occurred when the product was not completely cured. Heating units were installed to accelerate the curing cycle and to dissipate all retained moisture.

Air Leakage - ASTM E-283

Results - Leakage rate 0.008 L/sec/m^2. Exceeds standard requirement. Building Code ie. provides an effective barrier that will prevent condensation within the assembly and junction with other building elements.

Corrective Action - None required.

Water Infiltration - ASTM E-547

Results - If installed as intended, No leakage. Performs satisfactorily in preventing water infiltration.

Corrective Action - None required.

Surface Burning Characteristics - CAN4 - S102 - M88

Results - Reference Appendix Report Number 5962 "A"

	Warnock Hersey	Acceptable Level
Flame Spread Classification	5	25
Fuel Contributed	0	--
Smoke Developed	50	100/300

Corrective Action -

Flame Spread - None required (exceeds requirement)

Fuel Contributed - None required

Smoke developed - Although we exceed the minimum requirements to achieve Smoke Developed Classification, it was noted (see Appendix A) in 3 separate tests, 1 set of panels indicated a higher level than the other two. In consultation with Warnock Hersey, we were told that a 1" x 2" section of the surface had become dislodged. Our review indicated that this must have occurred due to improper handling and/or packaging when shipping to Vancouver. We NOTE no panels would be installed leaving a dislodged piece of surface section regardless of size. The materials used to connect the panels on location (the grout) would be the same material used to resurface any minor defect of this type. Had this been done, our smoke developed rating would decrease to approximately 12 as per trial #1 & 3.

Corrective Action - Special containers are planned for shipments to avoid any occurrence of this nature.

ASSESSMENT AND INTERPRETATION OF TEST RESULTS

We have concluded, as a result of our in-house testing and the tests conducted by Warnock Hersey, that with the necessary steps taken to correct the minor problems in material formulation and installation methods, that all indications are favourable for the product to satisfy all current building codes.

As you will note --- in most cases we exceed (better than) code requirements. We feel that with these accomplishments, and the test installations we have performed not only to our own satisfaction, but to that of the builders on whose properties our test installations were performed, that the product is ready for the marketplace.

CONCLUSIONS

CASTONE represents a new and innovative addition to the currently available siding, wainscotting and wall surfacing industry; this statement is based on surveys taken with architects, builders, contractors and spec writers; on the subsequent installation, and the results of the tests performed. We now feel comfortable in the establishment of a marketing program geared to the construction industry, as well as the average home owner renovation type market. Our plans are to continue to develop and to improve not only methods of production, but installation procedures.

In conclusion, we forecast the introduction of other realistically simulated surface utilizing the same materials and processes. Our intention is to do two or three more test installations, and upon completion we can see no reason why our production capacity, when ultimately properly funded, could be geared not only to national but international distribution.

Appendix A

Warnock Hersey

FILE COPY

WARNOCK HERSEY PROFESSIONAL SERVICES LTD
211 SCHOOLHOUSE ST. COQUITLAM, BRITISH COLUMBIA
CANADA V3K 4X9 TELEPHONE (604) 520 3321
TELEX ENVOY WPM 8076 TELECOPIER (604) 524 9186

FLAME SPREAD TESTING PROGRAM

CONDUCTED ON

A

CASTONE WALL PANEL

CLIENT

DDM INDUSTRIES LTD.
38 BRUCE CRESCENT
CARLETON PLACE, ONTARIO
K7C 3V6

REPORT PREPARED BY

WARNOCK HERSEY PROFESSIONAL SERVICES LTD.
FIRE LABORATORIES DIVISION
211 SCHOOLHOUSE STREET
COQUITLAM, B.C.
V3K 4X9

REPORT NUMBER:	5962
DATE TESTED:	JUNE 18, 1990
TEST STANDARD:	CAN4-S102-M88

PREFACE

This report describes the tests, standards and details for the sample of Castone Wall Panel manufactured by DDM Industries Ltd.

This report does not automatically imply product certification. Products must bear WHI labels in order to demonstrate Warnock Hersey certification.

Warnock Hersey

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RUN NUMBER 2	
RUN NUMBER 3	

DDM Industries Ltd.
Report No. 5962

INTRODUCTION

On June 18, 1990, the Fire Laboratories Division of Warnock Hersey conducted a test program to determine the surface burning characteristics of Castone Wall Panels, submitted by DDM Industries Ltd.

Testing was conducted in accordance with CAN4-S102-M88, "Standard Test Method for Surface Burning Characteristics of Building Materials".

Upon receipt of the samples at the Warnock Hersey laboratory, they were placed in a conditioning room where they remained in an atmosphere of 23 ± 3° (73.4 ± 5°F) and 50 ± 5% relative humidity until they reach a constant weight.

Three trial runs were conducted on the sample.

MATERIAL SPECIFICATIONS

The material was tested as selected and submitted by the client. It was assembled as per the client's instructions.

TEST PROCEDURE

The results of the test are expressed by three indexes. Each index expresses the characteristics of the sample under test relative to that of select grade red oak flooring and asbestos cement board.

A) FLAME SPREAD CLASSIFICATION

This index relates to the rate of progression of a flame along a sample in the 25 foot tunnel.

A natural gas flame is applied to the front of the sample at the start of the test and drawn along the sample by a draft kept constant for the duration of the test.

An observer notes the progression of the flame front relative to time.

The flame spread classification for red oak flooring is 100 and 0 for asbestos cement board.

CALCULATIONS

According to the test standard, the flame spread classification is equal to $\frac{5363}{(195-A_t)}$ when A_t is the total area beneath the flame spread curve, if this area exceeds 97.5 minute-feet.

If the area beneath the curve is less than or equal to 97.5 minute-feet, the classification becomes $0.564 \times A_t$.

B) SMOKE DEVELOPED

A photocell is used to measure the amount of light which is blocked off by the smoke passing down the tunnel duct.

When the smoke from a burning sample blocks the light beam, the output from the photocell decreases. This decrease with time is recorded and compared to the results obtained for red oak which is 100.

CALCULATIONS

$$\frac{10{,}000 - (\text{smoke integrator reading}) \times 100}{630} = \text{smoke developed}$$

DDM Industries Ltd.
Report No. 5962

TEST PROCEDURE - Continued

C) FUEL CONTRIBUTED

This is a measure of how much heat energy is given off by the burning of the sample in addition to that which is supplied by the natural gas burners.

The air temperature at the vent end of the tunnel is monitored throughout the test and the results are plotted versus time and compared to the results for red oak.

CALCULATIONS

$$\frac{[1.5 \times (\text{temperature integrator reading})] - 4968 \times 100}{4195.5} = \text{fuel contributed}$$

DDM Industries Ltd.
Report No. 5962

TEST RESULTS

FLAME SPREAD

The resultant flame spread classifications (rounded to the nearest 5), is as follows:

TRIAL NO.	AREA UNDER CURVE	FLAME SPREAD CLASSIFICATION
1	5	3
2	10	5
3	7	4
AVERAGE	7	5

SMOKE DEVELOPED

The areas beneath the smoke developed curve and its related classification (rounded to nearest 5), is as follows:

TRIAL NO.	AREA UNDER CURVE	SMOKE DEVELOPED
1	0	0
2	763	121
3	155	24
AVERAGE	273	50

FUEL CONTRIBUTED

The resultant areas under the time/temperature curve and its related classification (rounded to the nearest 5), is as follows:

TRIAL NO.	AREA UNDER CURVE	FUEL CONTRIBUTED
1	2257	0
2	2384	0
3	2327	0
AVERAGE	2323	0

DDM Industries Ltd.
Report No. 5962

CONCLUSIONS

The sample of Castone Wall Panels submitted by DDM Industries Ltd. exhibited the following flame spread characteristics, when tested in accordance with CAN4-S102-M88.

FLAME SPREAD CLASSIFICATION	SMOKE DEVELOPED	FUEL CONTRIBUTED **
5	50	0

** This is an apparent value, not a real value.

WARNOCK HERSEY PROFESSIONAL SERVICES LTD.

Reported by:

Fred Yasuda
Senior Technician
Fire Laboratories Division

Reviewed by:

Michael van Geyn, A.Sc.T.
Supervisor
Fire Laboratories Division

FY/mam

Warnock Hersey

DDM Industries Ltd.
Report No. 5962

TIME/DISTANCE CURVES

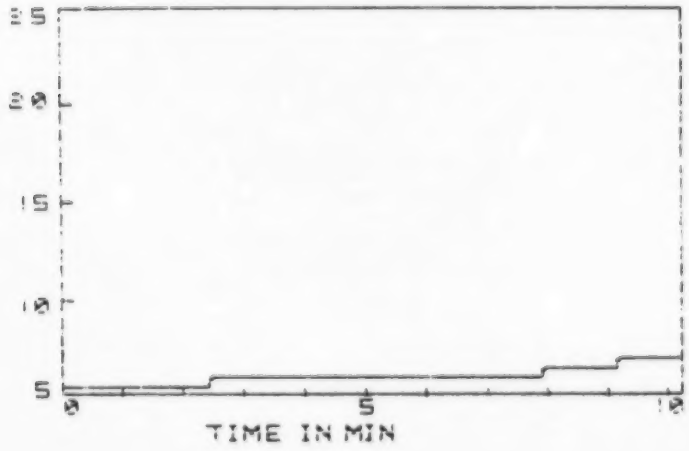
RUN NUMBER 1

FLAME SPREAD RESULTS FOR :

DDM INDUSTRIES LTD.

PRODUCT:	CASTONE WALL PANELS
TEST DATE:	06/18/90
TEST STANDARD:	CAN4 S102 M88
WORK ORDER:	50493-C7-596200
RUN NUMBER:	1

** FLAME TRAVEL IN FEET vs TIME IN MINUTES **



********** TEST RESULTS **********

AREA UNDER TIME DISTANCE CURVE	5 FT-MIN
FLAME SPREAD CLASSIFICATION FSC:	3
SMOKE DEVELOPED	0
FUEL CONTRIBUTED	0

MAXIMUM DISTANCE REACHED 7 FT. AT 538 SEC.

DDM Industries Ltd.
Report No. 5962

TIME/DISTANCE CURVES

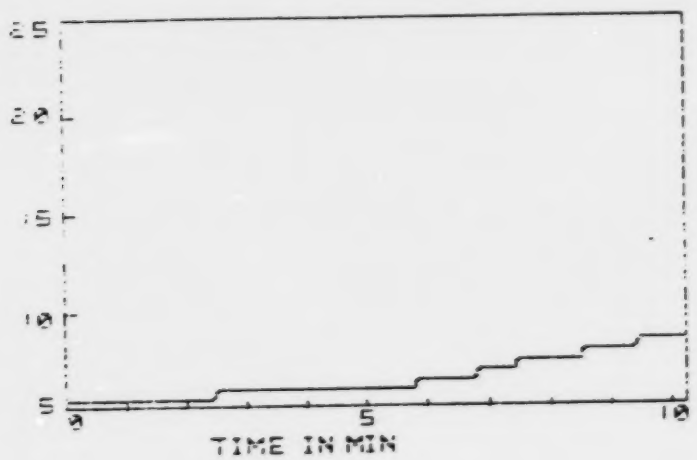
RUN NUMBER 2

FLAME SPREAD RESULTS FOR :

DDM INDUSTRIES LTD.

PRODUCT:	CASTONE WALL PANELS
TEST DATE:	06/18/90
TEST STANDARD:	CAN4 S102 M88
WORK ORDER:	50493-C7-596200
RUN NUMBER:	2

** FLAME TRAVEL IN FEET vs TIME IN MINUTES **



********** TEST RESULTS **********

AREA UNDER TIME DISTANCE CURVE 10 FT-MIN
FLAME SPREAD CLASSIFICATION FSC1 5
SMOKE DEVELOPED 121
FUEL CONTRIBUTED 0
MAXIMUM DISTANCE REACHED 8.5 FT. AT 554 SEC.

Warnock Hersey

DDM Industries Ltd.
Report No. 5962

TIME/DISTANCE CURVES

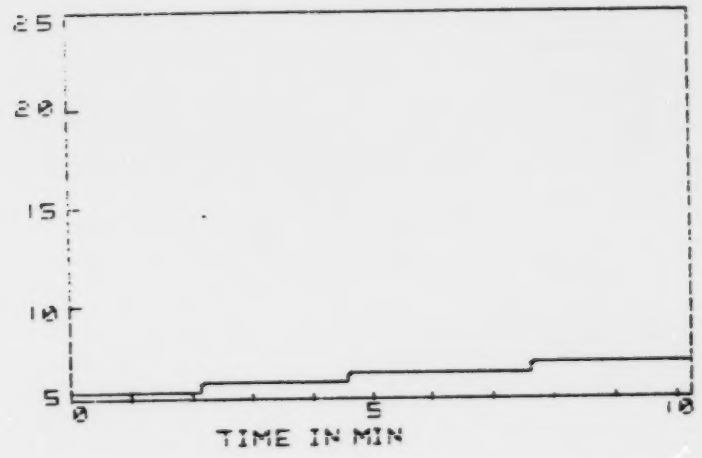
RUN NUMBER 3

FLAME SPREAD RESULTS FOR :

DDM INDUSTRIES LTD.

PRODUCT:	CASTONE WALL PANELS
TEST DATE:	06/18/90
TEST STANDARD:	CAN4 S102 M88
WORK ORDER:	50493-C7-596200
RUN NUMBER:	3

*** FLAME TRAVEL IN FEET vs TIME IN MINUTES ***



********** TEST RESULTS **********

AREA UNDER TIME DISTANCE CURVE 7 FT-MIN
FLAME SPREAD CLASSIFICATION FSC: 4
SMOKE DEVELOPED 24
FUEL CONTRIBUTED 0
MAXIMUM DISTANCE REACHED 7 FT. AT 450 SEC.

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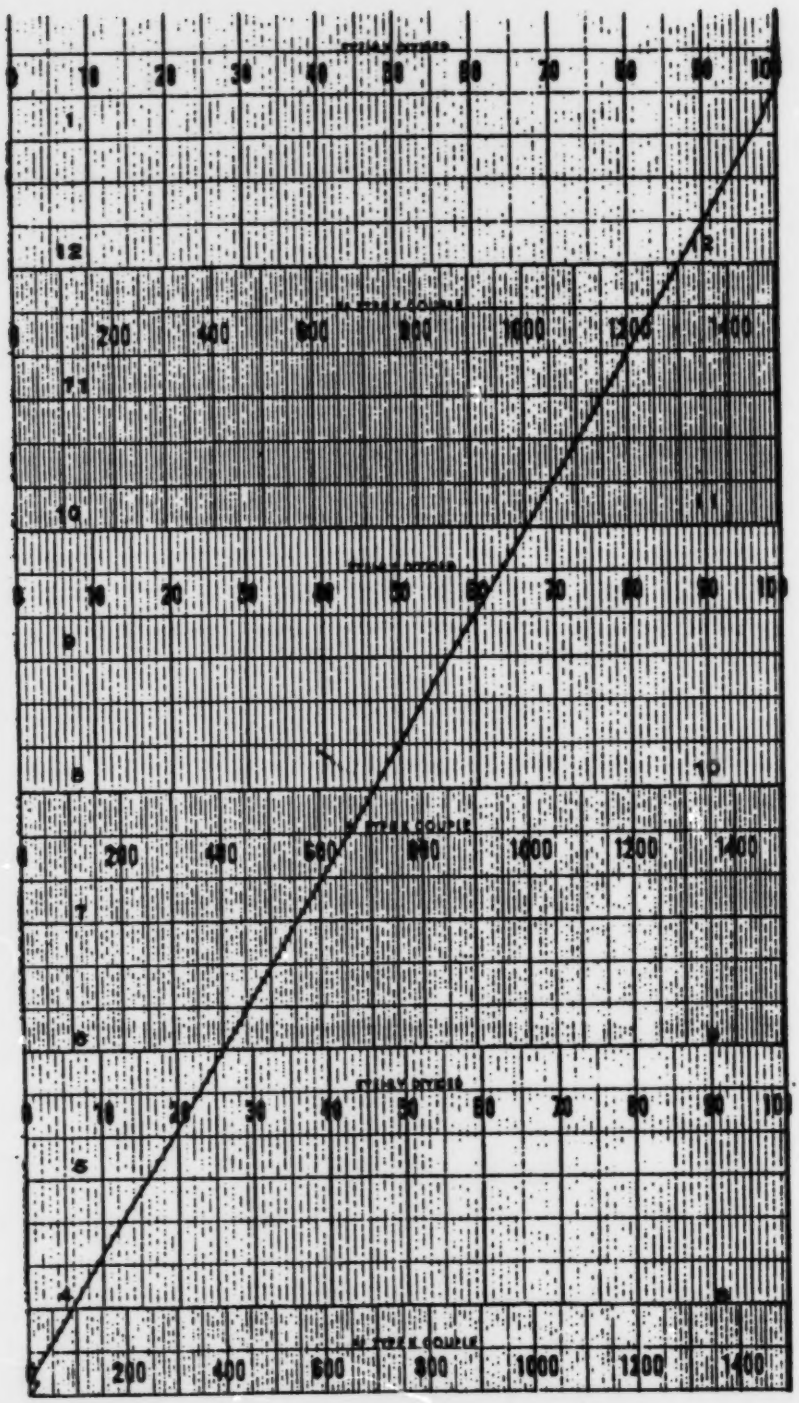
DDM Industries Ltd.
Report No. 5962

SMOKE DEVELOPED CURVES

RUN NUMBER 1



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DDM Industries Ltd.
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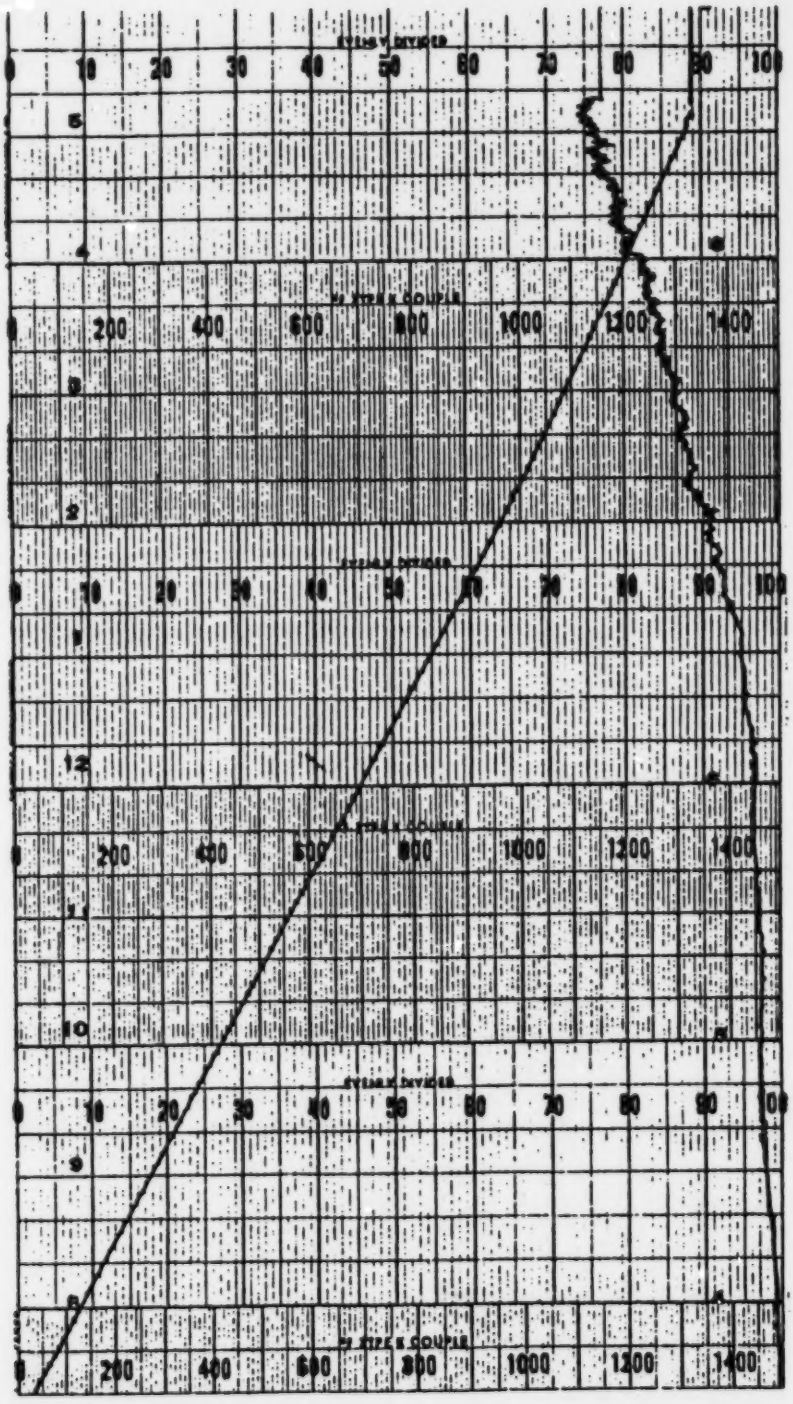
SMOKE DEVELOPED CURVES

RUN NUMBER 2



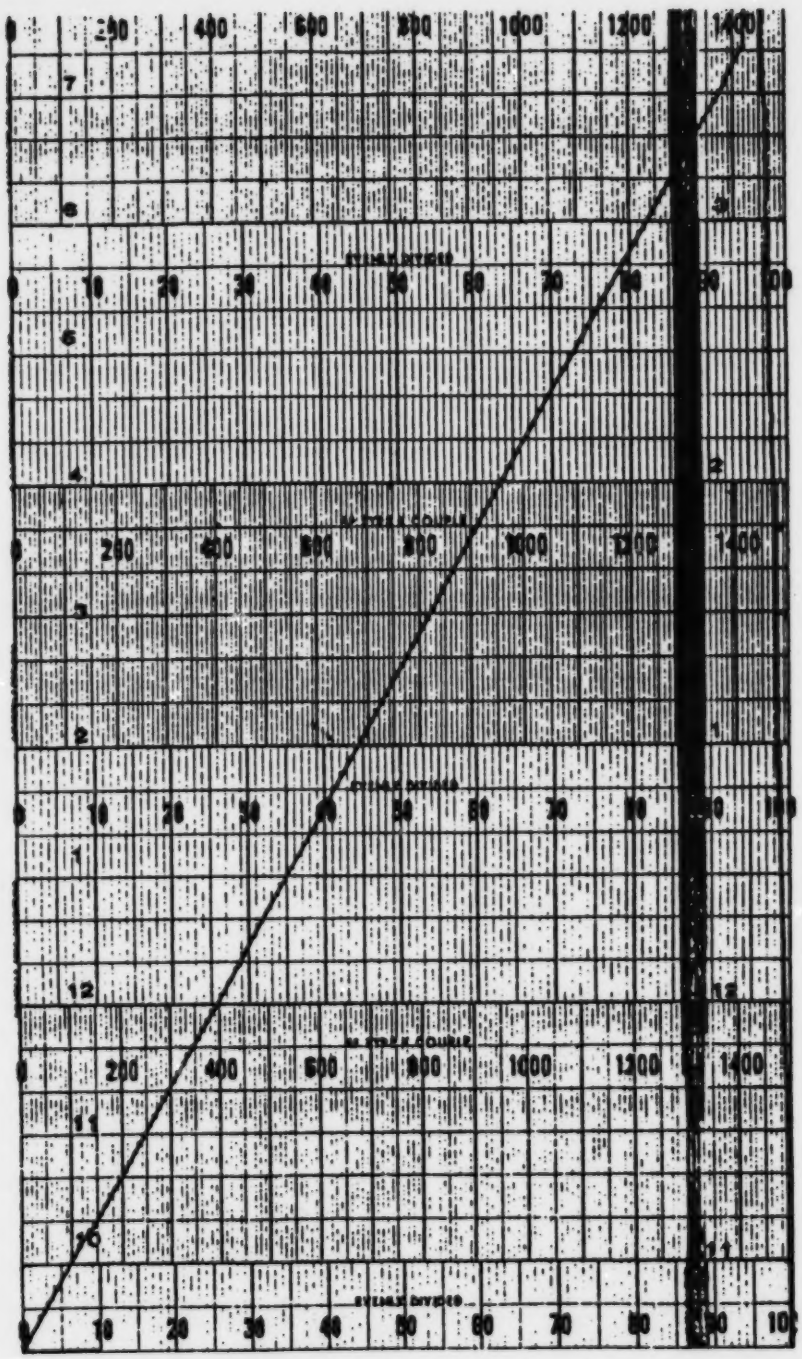
Warnock Hersey

A

DDH Industries Ltd.
Report No. 5962

SMOKE DEVELOPED CURVES

RUN NUMBER 3



Warnock Hersey

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DDM Industries Ltd.
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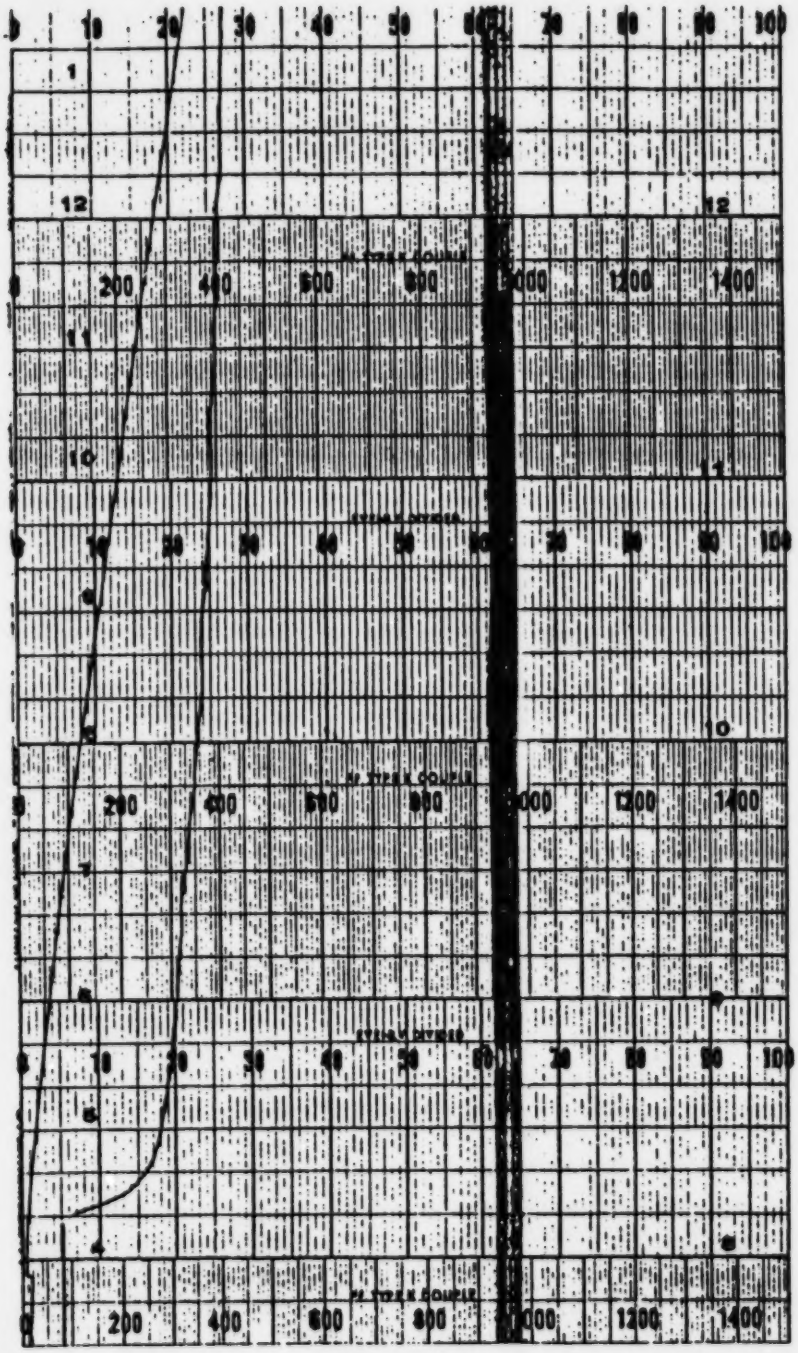
TIME/TEMPERATURE CURVES

RUN NUMBER 1



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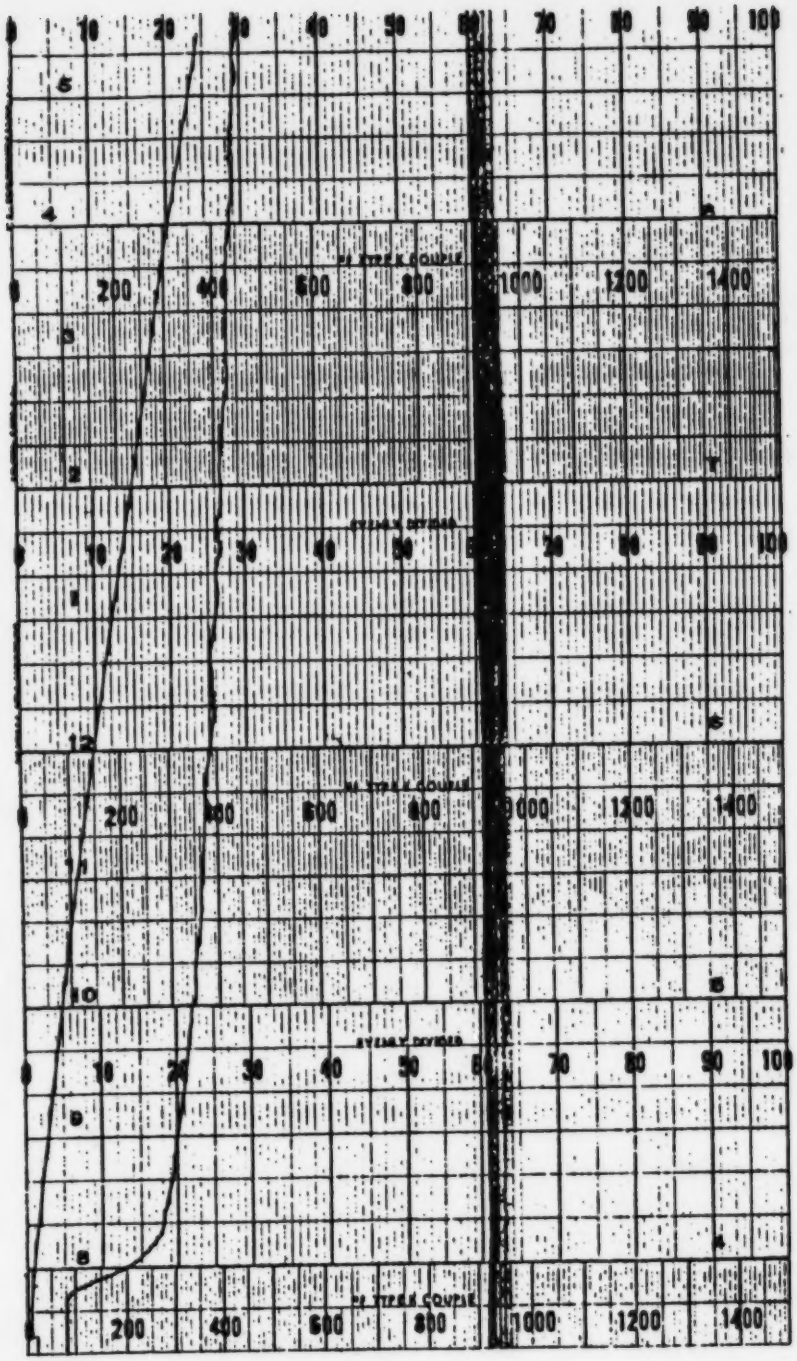
DDM Industries Ltd.
Report No. 5962

TIME/TEMPERATURE CURVES

RUN NUMBER 2

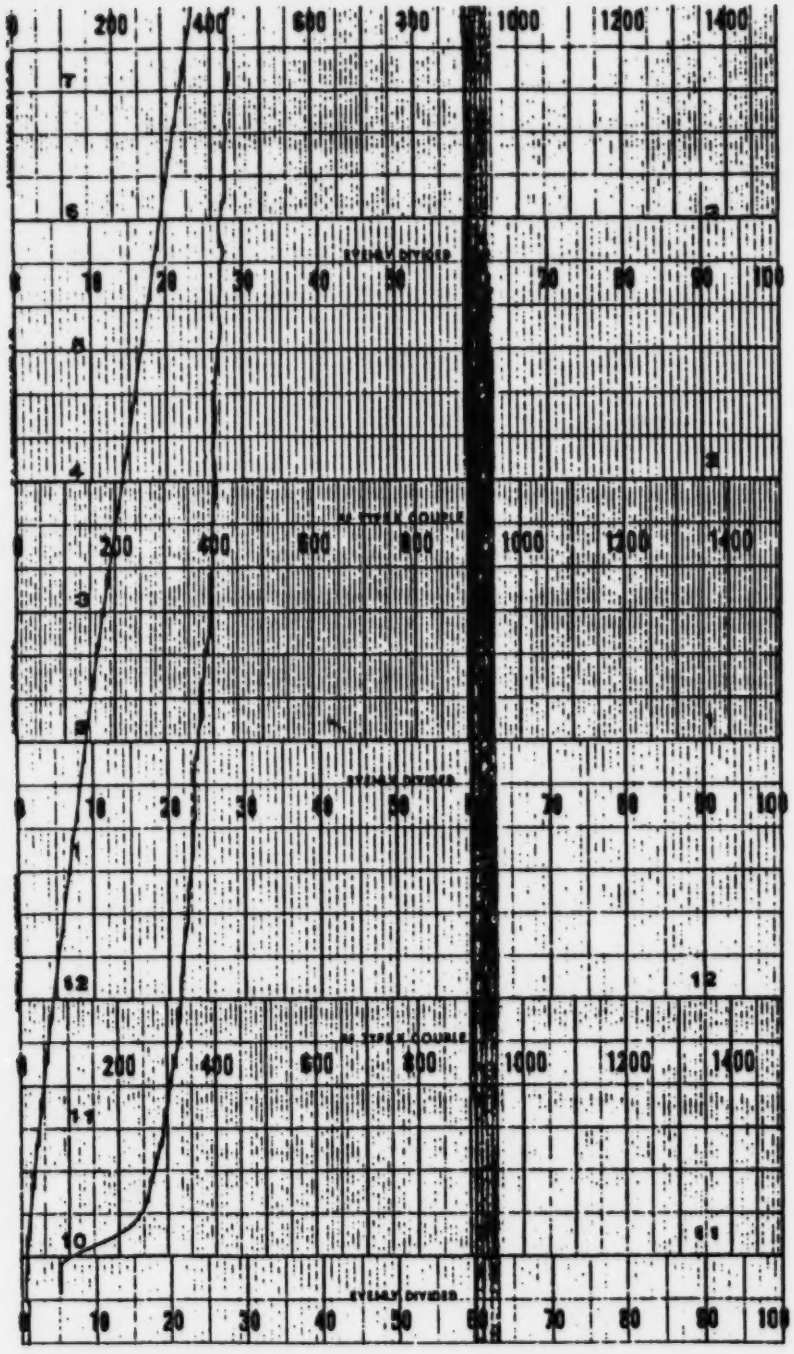


Warnock Hersey

DDM Industries Ltd.
Report No. 5962

TIME/TEMPERATURE CURVES

RUN NUMBER 3



FORM 150-1

Appendix B

Warnock Hersey Professional Services Ltd.
3210 American Drive, Mississauga, Ont. L4V 1B3 Telex: 06-968801

REPORT NO. 4064-1
FILE NO. 50284-C7
CLIENT NO. L12603
DATE July 6, 1990

DESCRIPTION Test of Composite Building Panel

CLIENT DDM Industries Ltd.
38 Bloor Crescent
Carleton Place, Ontario K7C 3V6 Attention: Mr. Glen Blanchard

---

INTRODUCTION

The client submitted samples of the Castone composite building panel for testing. The tests were undertaken for the purpose of submission to CCMC based upon the Technical Requirements for Composite Building Panels. The tests as requested by the client included air leakage, water infiltration, freeze thaw resistance and surface burning characteristics.

PRODUCT DESCRIPTION

The Castone panels tested were a composite of polyurethane foam substrate with a grey cementitious coating textured to the appearance of natural building stone. The cementitious cover was reinforced with mesh. The thickness of the cementitious cover was observed to be fairly uniform and over 13 mm. The total thickness was not systematically measured, but may be estimated at 40 mm average, varying continuously between 25 and 50 mm approximately. The back face was flat and paper coated. The cementitious material is carried over the edges as cover to the foam.

Cut specimens were supplied for freeze thaw (150 x 300 mm), and also for surface burning (550 x 1200 mm). One edge of the panels for surface burning and opposite edges of the stock size panels (1220 mm square) for air and water tests incorporated an interlocking edge pattern reflected both in the foam and the cementitious cover and intended to complete the simulation of natural stone.

PROCEDURE

Air leakage was performed in accordance with ASTM E-283. A lumber and poly air chamber enclosed the 2440 mm by 2440 mm vertical test wall comprised of 4 panels of Castone mounted on a stud wall consisting of 2" x 4" wood framing with studs 400 mm o.c. Fastening and joint sealing was as per manufacturer's instructions (see Appendix). Air flow was measured with a Schlegel Portable Infiltration Apparatus and pressure by inclined manometer. The test requirement was for leakage measurement at 75 Pa pressure difference.

Water infiltration was performed in accordance with ASTM E-547, using the same wall assembly as above, at a test pressure of 250 Pa, for 4 cycles, each 5 minutes at pressure and 1 minute without pressure difference across the panel. The water was applied using a 2400 mm square rack with nozzles on 600 mm centers.

Cont'd.....

THIS CERTIFICATE, OR REPORT, IS VALID ONLY FOR THAT WORK WHICH WAS SPECIFICALLY REQUESTED. THE COMPANY IS NOT RESPONSIBLE FOR ANY VIEWS OR OPINIONS EXPRESSED BY EMPLOYEES PERFORMING THIS WORK WHICH FALL OUTSIDE THE EXACT TERMS OF REFERENCE. ALL CERTIFICATES AND/OR REPORTS ARE THE RESULT OF WORK PERFORMED IN CONFORMANCE WITH APPLICABLE SPECIFICATIONS AND STANDARDS TO THE BEST OF OUR ABILITY AND INTENT. HOWEVER, THE COMPANY WILL NOT BE RESPONSIBLE FOR DEVIATIONS WITHIN THE NORMAL LIMITS OF ACCURACY IN ACCORDANCE WITH STANDARD PRACTICES.

PROCEDURE (Cont'd)

Freeze thaw resistance was performed in accordance with ASTM C67. It consists of alternate wetting, freezing, thawing and drying and includes 50 such cycles for this product.

Surface burning characteristics were measured in accordance with CAN4-S102-M88 utilizing the Steiner tunnel. The panels were laid with a joint every 1220 mm, the standard panel dimension. This joint was packed with a non-combustible product, not the cement (reportedly gypsum) supplied by the manufacturer. It was felt that the exclusion of this component would not adversely affect results.

RESULTS

The air leakage of the Castone Panel assembly was measured to be 0.05 L/sec. Based upon a wall area of 5.9 m^2, the leakage rate was 0.008 L/sec/m^2.

Minor water leakage was noted at two points during the first cycle. Examination revealed two faults in the jointing we had installed. No other leakage was noted. It appeared that the assembly, if installed as intended, would perform satisfactorily in preventing water infiltration.

After exposure to fifty cycles of freeze thaw, the panel specimens exhibited slight changes. The colour of the cover was somewhat bleached, but uniformly so. The specimens exhibited a weight loss of 5.2% (average). Cracking which had been present in the original samples did not appear to have changed.

Based upon three runs the surface burning characteristics were found to be Flame Spread Classification 5, Smoke Developed 50 and Fuel Contributed 0. The results per run were as follows:

Run	FSC	Smoke	Fuel
1	3	0	0
2	5	121	0
3	4	24	0

Tested By: Bill Wong/David Wren/Fred Vasuda **Reported By:** Peter Kidd

Respectfully submitted,

WARNOCK HERSEY PROFESSIONAL SERVICES LTD.

Peter Kidd, P. Eng.
Physical Testing Services

Vern W. Jones, C.E.T.
Assistant Manager
Physical Testing Laboratory

PK:VWJ:cc
Encl.

Appendix C

BASF Canada Inc.

BASF

Polymers

Mr. Dean Blanchard
DDM Industries Inc.
38 Bruce Crescent
Carleton Place, Ontario
K7C 3V6

June 7, 1989

Dear Dean,

The results of the insulation testing of your plaster wallboard are completed. Due to the shape of the sample, the values determined are not absolutely accurate, as the thickness is relative to the insulation value and this is difficult to measure accurately. To partially compensate for this, the thickness value used for calculation is the median. (i.e. maximum thickness was 5.66 cm and the thinnest measurable section was 3.20 cm. thus the median used was 4.43 cm.)

Thus the initial R-value was 6.25 (3.58 per inch) and the aged R-value was 6.85 (3.93 per inch). The accelerated aging is accomplished by by conditioning the sample for 7 days at 70 °C.

While it is unusual that the R-value increases with time, I think in this case that it was due to the drying of the plaster material. To ensure that this is indeed true, we will continue to age and test the material until the R-value remains constant or stops to drop.

If you wish a more quotable, exact value of the R-value. please submit a 12"x12" sample that is of representative thickness of the actual wallboard with the various components proportional to actual. The sample must be level and flat. With this an accurate determination can be made.

Sincerely,
BASF CANADA INC.

G.P. Gardin

Greg Gardin
Technical Service Representative
Polyurethane Systems

CC. K.B., A.S. and P.C

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